

Appl. No. 09/866,226
Amdt. dated January 18, 2007
Amendment under 37 CFR 1.116 Expedited Procedure
Examining Group 2157

PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended): A data duplicating method that connects a first information processing system comprised of a first host computer and a first storage device and at least one second information processing system comprised of a second host computer and a second storage device through a data transfer path and copies first update data generated in said first information processing system to said second information processing system,

wherein said first information processing system generates first difference control information for identifying any said first update data not copied to the second information processing system,

wherein said second information processing system generates second difference control information for identifying second update data generated in said second information processing system after taking over information and data processing performed by said first information processing system when said first information processing system stops operating, and after resumption of operation of said first information processing system, the second information processing system reads the first difference information and executes a logical sum operation on the first difference information and the second difference information managed in the second information processing system, a result of the logical sum operation being reflected in the second difference control information, said second update data [[is]] being selectively copied to said first information processing system on the basis of said second difference control information in which said logical sum is reflected,

wherein said difference control information is a bit map that indicates the presence or absence of completion of data duplication of said first and second update data at a plurality of individual units of data storage in each of said first and second storage devices.

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2. (Canceled)

3. (Currently Amended): A data duplicating method that connects a first information processing system comprised of a first host computer and a first storage device and at least one second information processing system comprised of a second host computer and a second storage device through a data transfer path and asynchronously copies first update data generated in said first information processing system to said second information processing system, said first information processing system having first difference control information for identifying said first update data not copied to said second information processing system, wherein said second information processing system creates second difference control information for identifying second update data generated in said second information processing system after taking over information and data processing performed by said first information processing system when said first information processing system stops operating, and after resumption of operation of said first information processing system, the second information processing system reads the first difference information and executes a logical sum operation on the first difference information and the second difference information managed in the second information processing system, a result of the logical sum operation being reflected in the second difference control information, a range of data being data in a range specified by said first and second difference control information is selectively copied to said first information processing system based on said second difference control information in which said logical sum is reflected.

wherein said first and second difference control information are a bit map that indicates the presence or absence of completion of data duplication of said first and second update data at a plurality of individual units of data storage in each of said first and second storage devices.

4. (Canceled)

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5. (Currently Amended): A data duplicating method that connects a first information processing system comprised of a first host computer and a first storage device and at least one second information processing system comprised of a second host computer and a second storage device through a data transfer path and asynchronously copies first update data generated in said first information processing system to said second information processing system, said first information processing system having first difference control information for identifying said first update data not copied to said second information processing system,

wherein said second information processing system produces second difference control information for identifying second update data generated in said second information processing system after taking over information and data processing performed by said first information processing system when said first information processing system stops operating, and after resumption of operation of said first information processing system, the second information processing system reads the first difference information and executes a logical sum operation on the first difference information and the second difference information managed in the second information processing system, a result of the logical sum operation being reflected in the second difference control information, said second update data [[is]] being selectively copied to said first information processing system on the basis of said second difference control information in which said logical sum is reflected,

wherein said first and second difference control information are a bit map that indicates the presence or absence of completion of data duplication of said first and second update data at a plurality of individual units of data storage in each of said first and second storage device.

6. (Canceled)

7. (Currently Amended): A data duplicating method that connects a first information processing system comprised of a first host computer and a first storage device and at least one second information processing system comprised of a second host computer and a

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second storage device through a data transfer path and synchronously copies first update data generated in said first information processing system to said second information processing system,

wherein said first information processing system generates first difference control information for identifying any said first update data not copied to the second information processing system,

wherein said second information processing system generates second difference control information for identifying second update data generated in said second information processing system subsequent to taking over information and data processing performed by said first information processing system when said first information processing system stops operating, and after resumption of operation of said first information processing system, the second information processing system reads the first difference information and executes a logical sum operation on the first difference information and the second difference information managed in the second information processing system, a result of the logical sum operation being reflected in the second difference control information, said second update data [[is]] being selectively copied to said first information processing system on the basis of said second difference control information in which said logical sum is reflected,

wherein said second difference control information is a bit map that indicates the presence or absence of completion of data duplication at a plurality of individual units of data storage in each of said first and second storage devices.

8. (Canceled)

9. (Currently Amended): A data duplicating system comprising a first information processing system comprised of a first host computer and a first storage device, at least one second information processing system comprised of a second host computer and a second storage device and a data transfer path through which data transfer between said first and second information processing systems is carried out, whereby said data duplicating system

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copies first update data generated in said first information processing system to said second information processing system through said data transfer path,

wherein said first information processing system generates first difference control information for identifying any said first update data not copied to the second information processing system.

wherein said second information processing system creates second difference control information for identifying second update data generated in said second information processing system subsequent to taking over information and data processing performed by said first information processing system when said first information processing system is disabled to operate, and when said first information processing system is enabled to operate, the second information processing system reads the first difference information and executes a logical sum operation on the first difference information and the second difference information managed in the second information processing system, a result of the logical sum operation being reflected in the second difference control information, said second update data being selectively copied to said first information processing system on the basis of said second difference control information in which said logical sum is reflected. ~~the function to selectively copy said second update data of said second information processing system to said first information processing system on the basis of said difference control information when said first information processing system is enabled to operate,~~

wherein said difference control information is a bit map that indicates the presence or absence of completion of duplication of said first and second update data at a plurality of units of data storage in each of said first and second storage devices.

10. (Canceled)

11. (Currently Amended): A data duplicating system comprising a first information processing system comprised of a first host computer and a first storage device, at least one second information processing system comprised of a second host computer and a second storage device and a data transfer path through which data transfer between said first and

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second information processing systems is carried out, whereby said data duplicating system asynchronously copies first update data generated in said first information processing system to said second information processing system through said data transfer path,

wherein said first information processing system produces first difference control information for identifying said first update data not copied to said second information processing system, ~~and~~ ~~and~~

wherein said second information processing system produces second difference control information for identifying second update data generated in said second information processing system subsequent to taking over information and data processing performed by said first information processing system when said first information processing system is disabled to operate, and when said first information processing system is enabled to operate, the second information processing system reads the first difference information and executes a logical sum operation on the first difference information and the second difference information managed in the second information processing system, a result of the logical sum operation being reflected in the second difference control information, a range of data being selectively copied to said first information processing system on the basis of said second difference control information in which said logical sum is reflected, the function to selectively copy data in a range specified by said first and second difference control information to said first information processing system when said first information processing system is enabled to operate,

wherein said first and second difference control information are a bit map that indicates the presence or absence of completion of data duplication of said first and second update data at a plurality of units of data storage in each of said first and second storage devices.

12. (Canceled)

13. (Currently Amended): A data duplicating system comprising a first information processing system comprised of a first host computer and a first storage device, at least one second information processing system comprised of a second host computer and a second storage device and a data transfer path through which data transfer between said first and

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second information processing systems is carried out, whereby said data duplicating system asynchronously copies first update data generated in said first information processing system to said second information processing system through said data transfer path,

wherein said first information processing system generates first difference control information for identifying said first update data not copied to said second information processing system, and ; ~~and~~

wherein said second information processing system generates second difference control information for identifying second update data generated in said second information processing system subsequent to taking over information and data processing performed by said first information processing system when said first information processing system is disabled to operate, and when said first information processing system is enabled to operate, the second information processing system reads the first difference information and executes a logical sum operation on the first difference information and the second difference information managed in the second information processing system, a result of the logical sum operation being reflected in the second difference control information, said second update data being selectively copied to said first information processing system on the basis of said second difference control information in which said logical sum is reflected, the function to selectively copy said second update data of said second information processing system to said first information processing system on the basis of said second difference control information when said first information processing system is enabled to operate,

wherein said first and second difference control information are a bit map that indicates the presence or absence of completion of data duplication of said first and second update data at a plurality of units of data storage in each of said first and second storage devices.

14. (Canceled)

15. (Currently Amended): A data duplicating system comprising a first information processing system comprised of a first host computer and a first storage device, at least one second information processing system comprised of a second host computer and a

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second storage device and a data transfer path through which data transfer between said first and second information processing systems is carried out, whereby said data duplicating system synchronously copies first update data generated in said first information processing system to said second information processing system through said data transfer path,

wherein said first information processing system generates first difference control information for identifying any said first update data not copied to the second information processing system,

wherein said second information processing system generates second difference control information for identifying second update data generated in said second information processing system subsequent to taking over information and data processing performed by said first information processing system when said first information processing system is disabled to operate, and when said first information system is enabled to operate, the second information processing system reads the first difference information and executes a logical sum operation on the first difference information and the second difference information managed in the second information processing system, a result of the logical sum operation being reflected in the second difference control information, said second update data being selectively copied to said first information processing system on the basis of said second difference control information in which said logical sum is reflected, the function to selectively copy data in a range specified by said difference control information to said first information processing system when said first information system is enabled to operate,

wherein said second difference control information is a bit map that indicates the presence or absence of completion of data duplication of said ~~first~~ first and second update data at a plurality of units of data storage in each of said first and second storage devices.

16. (Canceled)